CLAIMS

1. A method of recovering from ground bounce during a boundary scan test, said method comprising the step of operationally transitioning a Test Access Port controller from any of at least three undetermined controller states induced by the ground bounce to a determined controller state.

2 The method recited in claim 1 wherein the at least three undetermined controller states are selected from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, a SELECT-DR-SCAN state, and a CAPTURE-DR state.

3. The method recited in claim 2 wherein the at least three undetermined controller states are selected from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, and a SELECT-DR-SCAN state.

4. The method recited in claim 1 wherein the determined controller state is UPDATE-DR.

5. The method recited in claim 1 wherein the at least three undetermined controller states includes four undetermined states selected

from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, a SELECT-DR-SCAN state, and a CAPTURE-DR state.

6. The method recited in claim 1, wherein the controller transitioning step further comprises the step of providing a low Test Mode Select input to the TAP controller prior to a falling edge of a clock signal while in an UPDATE state.

7. The method recited in claim 6 wherein the controller transitioning step further comprises the step of providing the Test Access Port controller with a Test Mode Select input having the following bit pattern for a consecutive series of rising edges of clock pulses: a plurality of lows, high, a plurality of lows, high, high.

8. The method recited in claim 6 wherein the controller transitioning step further comprises the step of providing the Test Access Port with a Test Mode Select input having the following bit pattern for a consecutive series of clock rising edges of pulses: low, high, low, high, high.

9. A boundary scan apparatus with ground bounce recoverability comprising:

at least one Test Access Port controller; and

means for operationally transitioning the Test Access Port controller from any of at least three undetermined controller states induced by the ground bounce to a determined controller state.

10. The apparatus recited in claim 9 wherein the controller state transitioning means comprises means for providing the Test Access Port controller with a low Test Mode Select input prior to a falling edge of a clock signal while in an update state.

11. The apparatus recited in claim 10 wherein the determined controller state is UPDATE-DR.

12. The apparatus recited in claim 11 wherein the at least three undetermined controller states are selected from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, a SELECT-DR-SCAN state, and CAPTURE-DR state.

13. The apparatus recited in claim 12 wherein the at least three undetermined controller states are selected from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, and SELECT-DR-SCAN state.

14. The apparatus recited in claim 12 wherein the at least three undetermined controller states are four undetermined controller states selected from the group consisting of an UPDATE state, a RUN-TEST/IDLE state, a SELECT-DR-SCAN state, and a CAPTURE-DR state.

15. The apparatus recited in claim 14 wherein the controller state transitioning means comprises means for providing the Test Access Port controller with a Test Mode Select input having the following bit pattern for a consecutive series of rising edges of clock pulses: a plurality of lows, high, a plurality of lows, high, high.

16. The apparatus recited in claim 13 wherein the controller state transitioning means comprises means for providing the Test Access Port with a Test Mode Select input having the following bit pattern for consecutive series of rising edges clock pulses: low, high, low, high, high.

17. A boundary scan apparatus with ground bounce recoverability, comprising:

an in-circuit tester configured to provide a Test Access Port controller with a low Test Mode Select input prior to a transition from an update state; and

said in-circuit tester further configured to operationally transition the Test Access Port controller from any of at least four undetermined controller states induced by the ground bounce to an UPDATE-DR state.

18. The apparatus recited in claim 17 wherein the at least four undetermined controller states are selected from the group consisting of an UPDATE state, RUN-TEST/IDLE, SELECT-DR-SCAN, and CAPTURE-DR.

19. The apparatus recited in claim 17 wherein the in-circuit tester is further configured to provided the Test Access Port controller with a Test Mode Select input having the following bit pattern for a consecutive series of rising edges of clock pulses: a plurality of lows, high, a plurality of lows, high, high.

20. The apparatus recited in claim 18 wherein the in-circuit tester is further configured to provided the Test Access Port controller with a Test Mode Select input having the following bit pattern for a consecutive series of rising edges of clock pulses: a plurality of lows, high, a plurality of lows, high, high.

21. The apparatus recited in claim 17 wherein the in-circuit tester is further configured to operationally transition the Test Access Port controller from an undetermined data state to a determined data state.

22. The apparatus recited in claim 21 wherein said data state transition begins when the Test Access Port controller has reached the UPDATE-DR state.

23 22. The apparatus recited in claim 17 wherein the Test Access Port controller is one of a plurality of controllers in a boundary scan chain.

24 23. The apparatus recited in claim 20 wherein the Test Access Port controller is one of a plurality of controllers in a boundary scan chain.

25 24. The apparatus recited in claim 21 wherein the Test Access Port controller is one of a plurality of controllers in a boundary scan chain.

26 ~~25~~. The apparatus recited in claim 22 wherein the Test Access Port controller is one of a plurality of controllers in a boundary scan chain.